

S EISMIC AFETY AND AFETY

INSTITUTE OF GOVERNMENTAL
STUDIES LIBRARY

MAY 21 2002

UNIVERSITY OF CALIFORNIA

AN ELEMENT OF THE COMPREHENSIVE PLAN OF THE CITY OF MENLO PARK

Adopted by City Council on June 22, 1976

SPECIFIC ISSUES FOR THE CITY OF MENLO PARK

Major geotechnical constraints for the City of Menlo Park include liquefaction potential,* ground shaking intensity, expansive soils,* landslides, floodprone areas, and inundation from dam failure.

The bayland areas are most susceptible to liquefaction, in that this region is underlain by weakly consolidated Bay Muds and incorporated sand lenses, saturated* by a high groundwater table. Tsunami* inundation potential is moderate and will effect, principally, the currently undeveloped marshlands. Due to the fact that the area is at the southern end of the Bay, damping of the tsunami should dissipate much of the energy prior to inundation and, therefore, damage will probably be minimal. Flood run-off in the event of a 100-year storm can be expected to inundate most of the baylands.

The central portion of the City has a low to moderately-low liquefaction potential and will be subject to 'very strong' ground shaking intensities (San Francisco scale, Borchardt and Gibbs, 1975) in the event of a major earthquake. The area is underlain by older, weakly consolidated sands and gravels with a high water table. The southeast portion of the central part of Menlo Park, adjacent to East Palo Alto, is subject to flooding in the event of a 100-year storm. The Palo Alto and Stanford faults transect the central portion; however, these faults are considered to be inactive and are overlain with

*See Glossary (Vol. II, Appendix A)

more recent alluvial sediments. No movement is anticipated along either of these faults.

The Sharon Heights portion of Menlo Park is subject to strong ground shaking, landslides, and soil creep* and is known to have two existing landslides. Expansive soils in Sharon Heights have a high shrink-swell potential and are subject to seasonal soil creep (Fleming and Johnson, 1975). Dark soil derived from claystone is consistently 4'-6' thick and has dissection cracks up to 2 inches wide during the dry season.

In the event of the failure of the dams at Bear Gulch Reservoir and/or Searsville Lake, the resultant inundation will affect the northern and southern portions of the City, respectively.

Safety issues in Menlo Park include potential temporary isolation of the Sharon Heights area and Belle Haven, possible collapse of bridges, damage to San Francisco water lines traversing the City and culverts in a major earthquake, structural hazards, and the threat of urban catastrophic fire associated with the industrial area.

The potential for emergency access problems relating to Sharon Heights and Belle Haven is significant. Both areas rely on a limited number of ingress-egress routes, which, in the event of a catastrophe, could become blocked, preventing provision of emergency services or the evacuation and/or rescue of people in those areas. Additional circulation problems may arise should bridges over the San Francisquito Creek be severely damaged or destroyed. A similar problem exists with the storm drain

*See Glossary (Vol. II, Appendix A)

under Alameda de las Pulgas. In addition, potential failure of the Dumbarton Bridge and structures involving Interstate 280 and Highway 101 would substantially reduce access into the City. A corollary of this problem is that Menlo Park could be effectively cut off from acute medical care facilities, located across San Francisquito Creek at Stanford Hospital. However, this problem is mitigated to some extent by the availability within the City of the Veterans Administration Hospital, eight convalescent hospitals and rest homes, and one medical clinic.

Structural hazards due to seismicity are generally associated with the type of construction and the age of the structures. Generally, wood-frame structures do not present problems. However, unreinforced masonry buildings constructed prior to 1933, and possibly those built between 1933 and 1948, may be susceptible to structural damage. Portions of the central area of Menlo Park, its older churches, St. Patrick's seminary, and the Veteran's Administration Hospital may constitute potential hazards in need of further examination.

The threat of urban catastrophic fire also exists, primarily in the industrial portions of the City located at the easterly-most portion of the City immediately adjacent to the baylands (except for SRI and the City's Corporation Yard, located in the central portion). Twelve firms store (and in some cases manufacture) hazardous fuels and chemicals.

ALLOCATION OF RESOURCES

Policy

1. (1) Establish hazard reduction priorities so that judgments can be made regarding allocation of limited funds, if available, to the most critical areas or problems:
 - a. Significant and impending threats to human life or safety;
 - b. Unacceptable levels of potential economic loss;
 - c. Potential for widespread social disruption;
 - d. Significant threats to future populations or development;
 - e. Problems which are likely to result in minor adverse impacts.

(1) Number corresponding to the County-wide Seismic Safety and Safety Element.

EXISTING LAND USE

Policies

2. (2) Develop and adopt standards to reduce level of risk from natural hazards to an acceptable level for all land use.
3. (3) Encourage the reduction of unacceptable risks* associated with hazardous buildings through renovation, occupancy reduction, condemnation, and other programs.

Implementation Programs

4. (5) Determine the level of acceptable risk** which can be borne.
5. (7) Incorporate seismic risk analysis into existing structural inspection programs.
6. (6) Initiate a program of building inspection to identify all structures that 1) do not meet modern earthquake standards for construction, or 2) conform to design criteria of the building code since its modification regarding seismic hazard mitigation.
7. (9) Establish a program for the renovation or systematic elimination of hazardous structures.
8. (10) Revise all appropriate ordinances to require abatement of parapets, signs, marquees, and other exterior ornamentation which may be hazardous in the event of an earthquake.
9. (13) Advocate and support State and Federal financial assistance programs for the abatement of pre-1933 earthquake-hazardous structures.
10. (15) Support legislation providing for income tax incentives to encourage the repair or demolition of earthquake-hazardous old buildings.

*Unacceptable risk: Level of risk above which specific action by government is deemed necessary to protect life and property.

**Acceptable risk: Level of risk below which no specific action by local government is deemed necessary, other than making the risk known.

FUTURE LAND USE AND DEVELOPMENT

Policies

11. (16) Require submission of geologic, seismic, and/or soils reports prior to taking action on development proposals for locations identified as potential problem areas in this element.
12. (17) Prohibit structural development in areas where hazards cannot be mitigated by accepted methods to a level of acceptable risk.
13. (18) Require that all new development incorporate adequate hazard mitigation measures to reduce risks from natural hazards.

Implementation Programs

14. (21) Review and modify, if necessary, the building code to require that new construction be designed to withstand the level of acceptable risk.
15. (30) Require that potential geologic, seismic, soils, and/or hydrologic problems confronting public or private development be thoroughly investigated at the earliest stages of the design process, and that these topics be comprehensively evaluated in the Environmental Impact Report for each project, by persons of competent geologic expertise.
16. (35) Require that all private roads be designed to allow unrestricted access to all emergency vehicles as a prerequisite to the granting of permits and approvals for construction.
17. (36) Require that residential development be designed to permit maximum visibility and access to law enforcement and fire control vehicles consistent with privacy and other design considerations.

ZONING AND DIVISION OF LAND

Policy

18. [38] Integrate geotechnical hazard data and risk evaluations into zoning and subdivision ordinances.

Implementation Programs

19. [41] Modify zoning ordinance to require consideration of natural hazards and to provide for hazard reduction measures as a part of the design criteria for development.
20. [42] Review the subdivision ordinance and modify as needed to include hazard reduction in the process of dividing land.

PUBLIC UTILITY SYSTEMS

Policies

21. (43) Encourage the State Public Utilities Commission to monitor design and construction standards for utility systems traversing active or potentially active fault zones.
22. (44,45) Encourage local public utilities providing lifeline services to modify facilities and systems, if necessary, to reduce breakdown hazards to an acceptable level of risk to insure continued service in emergency conditions.

Implementation Programs

23. (49) Participate in a cooperative study involving public utilities, municipal agencies, and the California Department of Transportation to determine impact of a major earthquake on storage and transmission facilities (gas, water, electric, and telephones), water tanks, and major roads, bridges, and overpasses.
24. (50) Urge the Public Utilities Commission to require public utilities to apply the policies in this element to the planning and operation of their facilities, and to coordinate their activities with local planning agencies.

CRITICAL USE STRUCTURES

Critical use structures include those required for effective disaster response (emergency operating centers, police and fire stations, medical facilities), lifelines (gas, water, sewage, and electrical systems), and structures whose failure would be catastrophic (dams).

Policies

- 25. (54) Require that critical use facilities provide alternate sources of electricity, water, and sewage disposal.
- 26. (55) Require the strengthening or demolition of seismically hazardous structures used for places of public assembly.

Implementation Programs

- 27. (56) Require future critical facilities, e.g., hospitals, schools, E.O.C., etc., be sited only in areas of low fire hazard, not subject to flood or dam inundation, and where geotechnical risks are deemed to be acceptable.
- 28. (59) Support legislation to provide State financial assistance for the structural strengthening of existing hospitals inadequately designed and constructed to resist seismic forces.
- 29. Require that new critical structures be designed using the "Recommended Lateral Force Requirements" prepared by the Structural Engineers Association of California.

HAZARD INSURANCE

Policy

- 30. (68) Disseminate information to improve public awareness and understanding of available earthquake, fire, flood, and geologic hazard insurance.

Implementation Programs

- 31. (70) Investigate the availability of earthquake insurance and make this information widely available to the public.
- 32. (71) Obtain earthquake insurance for public facilities.
- 33. (72a) Seek to have Federal Flood Insurance Program modified to differentiate between flood threat in this area and seasonal flood conditions.

INTERJURISDICTIONAL COOPERATION AND COMMUNICATION

Policies

34. (74) Continue to improve interjurisdictional cooperation in regard to public safety concerns related to natural hazards, disaster response and mitigation.
35. (76) Support the San Mateo Area Disaster Office's emergency preparedness program.

Implementation Programs

36. (78) Participate in a cooperative County-wide program to pool natural hazard data developed through special studies or via the project review process.
37. (82) Urge and support legislation to require all federal agencies to apply policies and provisions of this element to the planning and operation of their facilities, and to coordinate these activities with local planning agencies.
38. (83) Consider participating in a cooperative County-wide building strong-motion instrumentation program for buildings over four stories in height with an aggregate floor area of 40,000 square feet or more, and every building over six stories in height, in order to broaden the existing data base on the amplification of frequencies of strong ground motion by multi-story structures and/or any other structures with similar responses.

EDUCATIONAL PROGRAMS AND RESEARCH

Policies

39. [85, 89, 90] Encourage improved seismic safety programs for schools, institutions, and industries to promote greater public awareness of all types of geotechnical hazards and appropriate responses.
40. [91] Support disaster information release programs for use in emergencies.

Implementation Programs

41. [92] Develop an information program to familiarize citizens, developers, and realtors with this element and its provisions.
42. [95] Initiate programs to educate all segments of the community regarding natural hazards, and conduct presentations which include practical suggestions on what to do and not to do in a disaster.
43. [99] Support active enforcement of State requirements for disaster drills in schools, augmented with a community awareness campaign on how, when, and where children are to be reunited with their parents.
44. Require that known or potential geologic, fire, and flood hazards be disclosed on all building permits, parcels, subdivision, and

HAZARDOUS MATERIALS

Policies

45. (103) Review and strengthen, if necessary, regulations for the manufacturing, storage, transportation, and use of hazardous and/or explosive materials to minimize risk to local populations.
46. (104) Encourage State and Federal transportation departments' review and State P.U.C. to regulations for the transportation of hazardous materials through local jurisdictions.

Implementation Program

47. (107) Monitor manufacturing, storage, transportation, and use of hazardous and/or explosive materials.

TSUNAMIS AND FLOODING

Policies

48. [108] Consider the threat of tsunamis in the planning and management of bayland areas.
49. [110] Improve regulations regarding the placement of proposed land uses in areas of flood potential.

Implementation Programs

50. [113] Modify land use plans in areas where tsunamis and flooding are hazards, and permit only uses which will sustain acceptable levels of damage and not endanger human lives in the event of inundation.
51. [114] Require that new structures in potential inundation areas either be elevated above the inundation level, or utilize waterproof hardware.

DAM SAFETY

Policies

52. [116] Consider potential risks from inundation in the development approval process.
53. [119, 120] Support programs to increase earthquake resistance of dams and mitigate impacts of dam failures, and support State efforts to inspect dams and evaluate dam safety requirements.

Implementation Program

54. [121] Modify land use plans to prohibit high-occupancy and/or critical use facilities in areas which would be inundated within 60 minutes of dam failure, or by more than one foot

FIRE AND HEALTH EMERGENCIES AND EVACUATION

Policies

- 55. (128) Improve standards and design criteria for structures and/or uses involving hazardous materials in areas which have high fire potential.
- 56. (141) Strengthen zoning and subdivision ordinances to provide for improved fire protection.
- 57. Encourage City-Fire District coordination in the planning process.

Implementation Programs

- 58. (177) Investigate the potential requirement that sprinklers be used in all new multi-story structures and in all large area structures with high occupancy rates.
- 59. (178) Investigate the potential requirement that fire-retardant roofing materials be used on attached dwellings or multi-family structures.
- 60. (179) Require that the fire district be notified of the change of use of a structure when it involves public assembly, and require that a Certificate of Occupancy be required before such a change of use is permitted.
- 61. (184) Investigate the concept of "defensible space" relating to public safety and implement as appropriate.
- 62. Undertake a program to identify fire hazard zones.
- 63. Investigate potential impact of train derailment on emergency services.
- 64. Investigate and plan for impact of fuel shortages on emergency services and normal lifeline facilities.

DEPENDENT POPULATIONS

Policies

- 65. [188] Provide for the needs of dependent populations in earthquake response and recovery operations and in evacuation planning.
- 66. [189] Review and improve disaster response capabilities for multi-story structures and dependent care facilities.

Implementation Program

- 67. [190] Review current building code requirements for facilities housing dependent populations, and improve code requirements when needed.

ELEMENT REVIEW, UPDATE, AND COORDINATIONPolicy

68. (193) Review this element as needed, and comprehensively revise whenever substantial new scientific evidence becomes available, and coordinate with other General Plan elements.

Implementation

69. (194) Implement and coordinate this element with other plan elements and make necessary revisions.